26th September 1919.

Mr A. Robertson,

Harrison Lake Hatchery,

Harrison Hot Springs, B. C.

Dear Mr Robertson:-

I am just in receipt of your letter of the 21st., inst., and have to thank you for your views, which interest me deeply. We both have the same object in view i. e., the restoration and enlargement of the sockeye salmon industry, and if a friendly comparison of ideas can help solve the problemn, I know you will not begrudge, anymore than I do, the time it takes to properly discuss the question.

To begin with, I presume you are aware my article in the Province was written to offset the efforts being made - and which are still continuing - to have artificial propagation of sockeye salmon discontinued in British Columbia. These efforts are largely put forth by some canners who saw certain effects and jumped to conclusions as to the causes thereof; but their representations are likely to receive greater support than they deserve through the discouragement expressed by parties whose knowledge of hatchery propagation gives them the right to speak authoritively. Mr Babcock, for instance, has made the admission that he had almost given up hope of artificial propagation of sockeye ever being successfully accomplished, and such an opinion from one holding his official position strengthened the case of those wishing to have sockeye hatcheries abolished. Mr Babcock deserves the lion's

share of credit for restoring spring salmon to the Sacramento river by means of artificial propagation, and having accomplished that, his adverse opinion as to hatcheries succeeding with sockeyes will receive greater credence than it possibly deserves.

Replying specifically to your present letter, I readily concede that excessive fishing has been one factor in depleting the supply of sockeye salmon. I do not think however it ranks as the primary cause. The Hell Gate slide undoubtedly killed the "big" year on the Fraser, but as it did not affect the runs of "off" years it cannot be ranked as a deciding factor in three years out of every four. Sockeye depletion has occurred in other rivers and streams, where neither excessive fishing nor slides like that at Hell Gate were experienced, and yet these localities have likewise shown a diminution in their sockeye runs following the installation of hatcheries. I give you Clayoquot in B. C. and Karluk in Alaska as two examples.

You say "the Harrison watershed was never the main spawning ground of the sockeye ..... the upper Fraser which produced the bulk of the big run has suffered depletion more than any other locality." In this opinion I do not agree. I believe the Harrison watershed up to 1899 was the main spawning ground for Fraser river sockeyes and that except in one year out of every four the Fraser river beyond Yale was but a negligible factor.

Mr Babcock's first visit to the spawning beds was in the "big" year of 1901. He found every tributary of the river swarming with adult salmon and he naturally concluded they were s

similarily visited every season. This however was not the case, and while all his subsequent reports point out the scarcity of fish in these upper waters in each succeeding "off" years; and while he attributes this shortage largely - if not wholely - to excessive fishing; the indisputable historical fact remains that this state of affairs existed for a hundred years previous to his first observations. As far back as 1815 it is recorded for the upper Fraser that "The salmon failed with us last season (1814). This generally occurs every second year and completely so every fourth year." Again in 1827 the run in all the tributaries above the Thompson was a complete failure, while from the trading post at Kamloops only 4,000 salmon were obtainable to supply the shortage existing at posts farther north. Year after year in "off" seasons the upper Fraser trading posts had to obtain their supply of dried salmon for dog food from Babine Lake because less than 10,000 fish were obtainable from the Fraser river runs. It would therefore seem that except as to "big" years the upper Fraser did not "produce the bulk of the big run." Nor can excessive fishing be held responsible for depleting these waters since a chronic state of depletion existed there for a century before commercial fishing started.

On the other hand all obtainable information goes to prove that the Harrison watershed enjoyed a good run of sockeyes every year. Climatic conditions doubtless were responsible for the upper Fraser failing three years out of every four, and to the same causes are probably attributal the fluctuations which occurred from time to time in the runs to other localities. But until 1899

there seems to have been no great natural cause for diminishing the supply of sockeyes in the Harrison watershed and, except for the loss through freshets that season, I believe the hatchery operations have been principally responsible for the depletion which has taken place there.

The salmon packs of the Fraser/Puget Sound canneries from 1890 to 1899 were quite uniform, except in the years of the "big" runs, and I take it the packs then obtained were a fair criterion of the Harrison watershed's contribution to the sockeye pack of the district. The increase obtained in "big" years represented the upper Fraser's contribution to the industry. That excessive fishing was not a factor in "big" years was shown by the 1913 run that reached Hell Gate exceeding that of any previous "big" year under Mr Babcock's observations; and this notwithstanding the fact that the amount of fishing gear employed and the quantity canned in that season was larger than ever before. That excessive fishing this season (1919) was not the greatest factor is proven by the report Col. Cunningham showed me from Birkenhead hatchery that, despite all the efforts to intercept them, the sockeyes reaching those waters were far more numerous than for many years previous. Again, to stray further afield, the failures on Rivers Inlet in 1917, 1918, and 1919, cannot be ascribed to excessive fishing, for while the packs of 1913, 1914, and 1915 were satisfactorily large, the spawning beds were well seeded in the years last mentioned; in fact more fish reached the spawning beds in 1915 than were ever noted previously.

It was not, to my mind, the destruction of any given quantity in any one season that has made hatchery operations deplete the sockeye supply. It has been the long continued stripping of the natural spawning beds of adult fish - with no attempts made to replace them - that has caused the damage. Certain it is that year after year, and despite commercial fishing operations, Silver and Morris creeks, and other tributaries of Harrison Lake, were crowded with matured sockeyes that had reached their objective after running the gauntlet of all the appliances used to intercept their passage. It is equally certain that to-day these same streams are deserted. Why should this occur in Harrison lake streams while sockeyes still <u>pass through</u> the self same lake seeking the waters of Lillooet lake beyond ? It surely cannot be that traps, seines, and gill nets discriminate in their catches to the detriment of Harrison lake fish and to the benefit of those of the Lillooet. Some other factor than excessive fishing must be responsible and this factor I believe to have been <u>past hatchery operations.</u>

As to the Harrison Rapids fish taken last fall having all been sockeyes that went to sea as fry, Dr Gilbert of course does not say all fry are lost. The percentage however is very small and "the exception proves the rule." The three hundred you caught might have been one hundred times more numerous had the fry been planted in streams - Our Hamu operations would rather prove so - and I think the same remarks apply to Stream versus Lake planting of fry. The instinct to hide must necessarily be greater developed; or rather developed in a greater number of

fry. if they are planted in shallow streams and surrounded by gravel from the moment of birth, rather than where planted in the deeper waters of a lake where the need of hiding for self protection cannot be as apparent. The use of gravelled boxes will reduce trout depredations to a minimum, and doubtless you will yet find a suitable method of holding the young fish in some sort of retaining ponds until they reach the fingerling stage. When this is accomplished I believe over 50% of all the fry you hatch will return to their native streams as adult salmon, and that when this day arrives the annual available supply will dwarf into insignificance the biggest "big" year the Fraser has ever experienced.

I would be pleased to hear from you again at your convenience,

Yours sincerely

HD/P.